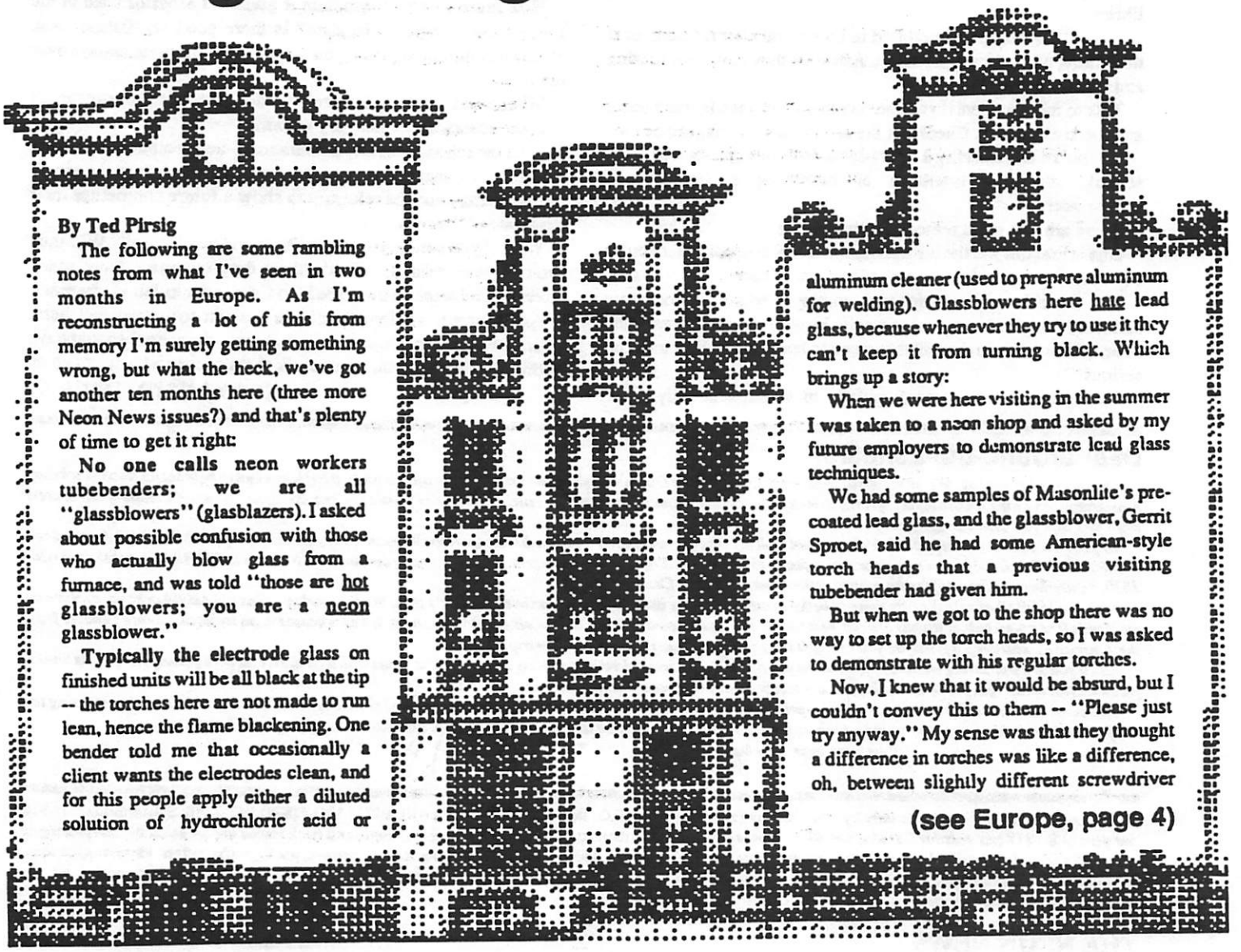
THE NEON NEWS

THE NEON NEWS

HAVE BLOWHOSE, WILL TRAVEL

NUMBER 9 **FALL/WINTER 1991-92**

Seeing new light in an Old World



By Ted Pirsig

The following are some rambling notes from what I've seen in two months in Europe. As I'm reconstructing a lot of this from memory I'm surely getting something wrong, but what the heck, we've got another ten months here (three more Neon News issues?) and that's plenty of time to get it right:

No one calls neon workers tubebenders; we are all "glassblowers" (glasblazers). I asked about possible confusion with those who actually blow glass from a furnace, and was told "those are hot glassblowers; you are a neon glassblower."

Typically the electrode glass on finished units will be all black at the tip -- the torches here are not made to run lean, hence the flame blackening. One bender told me that occasionally a client wants the electrodes clean, and for this people apply either a diluted solution of hydrochloric acid or aluminum cleaner (used to prepare aluminum for welding). Glassblowers here hate lead glass, because whenever they try to use it they can't keep it from turning black. Which brings up a story:

When we were here visiting in the summer I was taken to a neon shop and asked by my future employers to demonstrate lead glass techniques.

We had some samples of Masonlite's pre-coated lead glass, and the glassblower, Gerrit Sproet, said he had some American-style torch heads that a previous visiting tubebender had given him.

But when we got to the shop there was no way to set up the torch heads, so I was asked to demonstrate with his regular torches.

Now, I knew that it would be absurd, but I couldn't convey this to them -- "Please just try anyway." My sense was that they thought a difference in torches was like a difference, oh, between slightly different screwdriver

(see Europe, page 4)

Through the past darkly: How to learn neon

By Ted Pirsig

I've heard many stories of people learning the basics of neon in a six- or eight-week course and then not continuing for long. A friend told me that of the class I was in (seven people, five years ago) I'm the only one still in the field, and it's the same for him in his class (ten people, three years ago). This made me think, "Gee, maybe someone considering neon school should be forewarned a little." And hence the following:

IF you're considering learning neon:

Realize just what it is that you're getting into: a very technical and difficult craft whose central aspect is hand-eye coordination.

You won't spend much time with bright pretty lights -- you'll mainly be holding glass over gas torches, something less glamorous than many people envision. And the sign business, where most benders earn their living and learn enough to start their own businesses, won't be much interested in your creative impulses.

You will get cuts and burns, rather often at first, and work with noxious smells (such as burning blockout paint) and toxic chemicals, and perform death-defying stunts on high-voltage equipment.

IF you're still interested:

Check out what your future prospects might be:

Visit neon sign companies where you live, or call those in areas where you want to live (see the yellow pages collection at a good library).

Ask if they might be interested in hiring you after training, or if they know other shops that might. Ask what they pay, both starting and top salaries.

Talk to their benders if you can: ask them how they learned neon, and ask their advice. Check out the ads in the sign magazines too.

IF you're considering a short-term (six- or eight-week) neon school, with the intention of becoming a journeyman tubebender:

There are two good reasons for this choice.

One is that despite the tuition it is relatively cheap, in that you're not without income for an extended period of time.

The other is that a prospective employer will take you more seriously than the average neon wanna-be who wanders through the door. ("You went and spent that much to learn neon? You must be serious!")

That said, there are many pitfalls to avoid, and only some preparation and research will help you steer clear of them:

You must visit the school -- more than one if possible; there are nearly two dozen around the U.S. at last count and they vary widely in cost and quality.

Once there, look around and ask hard questions:

How many hours? How many teachers and students? How much tuition? How much time spent bending?

Is installation covered? How much electronics theory for wiring and loading? Is manifold repair and construction covered, and will students actually practice these skills? (This can be a first-job killer: see NN#1.)

Is the pumping equipment state-of-the-art? If not, why not? Is alternative equipment discussed, or just how to use what the school happens to have? Will you learn to work with colored glass?

You can expect about a year of frustration after neon school. The early months will be hard on your self-confidence, because your work will be slow and of uneven quality.

How many torches are there? Will you have to share torches? This may be the norm, but it is not desirable, and wastes a lot of time.

How much safety information is given? Is asbestos used in the shop? How is mercury handled? Is there good ventilation? Ask about air conditioning too if you'll spend any hot summer days over the fires.

What books and materials are provided, or need to be purchased?

Is the school accredited? By whom?

Does the school also have a commercial-neon counterpart? (If so, it's best not to announce your intention to set up shop in the area -- the instructors may be reluctant to show a future competitor their hard-earned "secrets.")

What if you decide you don't like it and want to quit? Will they pro-rate your refund? What's their drop-out rate? How many students find work in the trade? Do they assist in job placement?

And be sure to ask for a list of past students so you can call them. A list is better than a few phone numbers -- the school should have nothing to hide, and you want to talk to the people who didn't go on

(see Learn, page 4)

Dear around-the-benders,

The cat is out of the bag: We've moved to Europe for a year. Three Dutch sign shop owners (together with Peter Mason) hired Ted to help set up Neon Workshop Amsterdam, an evangelical outpost of American-style lead-glass neon. (As of our last issue, negotiations hadn't really started, so we weren't keeping any secrets from you; life just changed real fast.)

So you won't get us on the phone in Volcano, but mail is being forwarded. Or write us direct: c/o Neon Workshop, Van Diemenstraat 368, 1013 CR Amsterdam, NETHERLANDS. It only costs a buck or two to fax us (31-020-626-2789), truly the next best thing to phone conversations (home is 627-4983, workshop is 626-3530; remember the time difference puts us seven hours ahead of Central time).

But even Ma Bell admits the best thing is being there. And in the case of Amsterdam in autumn, it's true. We live carless in an old neighborhood, explore on weekends (the co-ed public saunas are our best fun so far), and of course we think you all should visit. In fact, Ted's bosses hope to recruit future benders from the Americans who drop by; maybe you can write it off on your taxes as an interview trip?

And if you are wondering what happened to the fall issue, it's the same old story: moving across 12 time zones with a toddler, and then getting sick for six weeks, just took the wind right out of us. As before, all subscriptions continue a season longer.

This issue has bounced from Amsterdam to a printer in Minnesota, to UPS, to Val's sister, to the mail, and thence to you. Such logistics (and that amazing toy the fax) will keep this newsletter going wherever we are -- the stops en route to home include Cairo, Bangkok, Hong Kong and Taipei.

Best from beer- and bulb-land,

Ted + Val

The Neon News is published quarterly by Val Crawford and Ted Pirsig, P.O. Box 668, Volcano, Hawaii, 96785 USA; (808) 967-7648. Subscriptions are $16 per year U.S., $18 per year for Canada, and $20 per year foreign subscribers, payable in U.S. currency. Single and back issues are $4 each. No advertising is accepted, except for classifieds, available to subscribers only at $.50 per word. The Neon News welcomes stories, artwork, photographs, letters, ideas, suggestions, irate comments and endless praise. The editors make no pretense to be authorities in the field; the newsletter is intended to be a forum where neon folks can exchange ideas and information.

Sneaky tricks, a shocking tale & a warning

<Candice King came to neon years ago with a background in ornamental glass and color overlay work, and lives in Tampa FL.>
By Candice King

I don't know if these tips have been passed along yet, but I thought I'd put my two cents in.

On the subject of cracks running up a long curve when cut cold, I have three solutions:

1. **Don't let it happen.** Mark and cut your tube while still hot, and cool it in a rack, not flat on the table. Annealing helps too.

2. **Cut it later.** If you can't cut it while hot (phone rang), cool it in a rack, mark the cut and sneak it into the crossfire. Heat it just until the glass will pull apart ever so slightly (important with coated tubes). Lay it on the bench and cut after about 20-30 seconds. You will usually get a great straight cut. Cool it in a rack.

3. **My god -- the bend has a crack and I'm out of glass.** Time to be sneaky again.

Most of the time you can heat up a crack. Hold the tube cut-end-up with the crack facing the crossfire, with the bottom of the crack two to three inches above the fire. Gradually move the tube toward the fire (so as not to shock the glass and make the crack larger, or a chunk fall off the side of the tube). With a little practice at being sneaky you'll get the hang of it.

Don't put the tube directly in the crossfire center; stay out to the edge. In a few seconds start to move down slowly and you should start to see the crack heal.

Slowly move as the crack heals, and finally fire-polish the end so the crack doesn't start again. Cool in a rack and presto! you won't have to order a case of glass after all.

It takes a little practice, but keep trying. All you've lost is a little time. This trick can save you a lot in the long run. I've closed up cracks as long as eight inches without problems later on...

Oh yeah. I got zapped by a bombarder and lived to tell about it.

In 1984 I was working in Virginia. The uninsulated bombarder leads were laying over the conduit that went to the switch. It was a rainy morning and the juice traveled up the dirt on the wires through the conduit -- and you guessed it: ZAP.

It went in my hand, out my chest and arced to the vacuum gauge, which blew up. It fused a 10mm glass stopcock. Thank God I was standing on a rubber mat.

My right hand and arm were paralyzed for about a week, and it took weeks to get back the full use of my hand. I don't even want to talk about having the burns on my chest cared for (ouch).

I am now a firm believer in the Broomstick Method of switch engagement. Being just a dumb girl I didn't know much about wiring and safety concerning bombarders at the time, but believe me, I'm a quick study.

One more thing I and a lot of others in this area are having problems with is carpal tunnel syndrome.

That's that all-too-familiar tingle in your fingers (usually the left or power hand) or the feeling of being mildly shocked, or a constant ache in the wrist. Many people lose the use of their hand altogether before having surgery.

When I performed the whole job (bending, pumping, patterns, blockout, etc.) I never had any problems with this. But here in Florida, where wholesale shops abound, all I do is bend all day, and I've started to have a lot of problems.

I'd like to find out how to help myself and others avoid the horrors of carpal tunnel syndrome.

P.S. Women benders unite -- let's hear more from the ladies.

<Val says: Carpal tunnel syndrome is one form of "repetitive stress injury" or RSI. It's also known as the journalism plague, since hundreds of people who hammer on computer keyboards have been crippled by it. They literally lose the use of their hands.

I know several RSI victims, including a good friend who hasn't been able to lift more than four ounces for years now, much less return to her reporting job. (Her newspaper has had over a hundred RSI cases; at my old paper, more than a quarter of newsroom workers had RSI symptoms.) She can't drive, or buy groceries and cook them, or even handle money. She isn't getting better, despite years of therapy, and surgery offers little hope.

Carpal tunnel syndrome is literally an irritation of the nerves to the hands, which pass through a sheath of fibrous tissue called the carpal tunnel. If something narrows this tunnel -- swelling, constant irritation, etc. -- the nerves are pinched.

About a quarter of all pregnant women get a taste of it, due to general water retention and swelling. This kind of carpal tunnel syndrome generally goes away, but pregnant benders should take care not to let it cause permanent damage by ignoring it.

The first symptom is tingling or numbness. Don't let it get any worse before doing something about it!

GET MEDICAL ADVICE: make a phone call the first day you notice anything, and keep at it. Call OSHA to ask for their publications, if your doctor doesn't have any. Most librarians have seen articles on RSI too; ask and they'll be happy to help you. Don't shrug off numb hands; your working life may depend on it.>

Mercury makes the media

<A friend sent this story from the Oct. 15 Seattle Post-Intelligencer; the official overreaction made us wonder if we'd make more money just declaring our shop a toxic waste site and getting a piece of Superfund to clean it up proper...>

"Four classrooms were closed and two dozen pupils were decontaminated at Cougar Valley Elementary School yesterday after liquid mercury was accidentally spilled in a classroom.

"The incident prompted a response by firefighters and members of a hazardous materials team from the nearby Bangor Submarine Base. There were no injuries, but the two dozen pupils were given emergency showers and fresh clothes.

" 'As it turned out, it was minor,' said Roy Lush, assistant chief of Kitsap County Fire District 1. 'We took it as a serious matter.'

"The spill occurred about noon as students played with some mercury a classmate had brought from home.

"Mercury is a heavy, silver-colored metallic element that is liquid at ordinary temperatures. It has long been a curiosity in science classes but also is considered hazardous.

"In sufficient quantities -- much greater than anyone experienced in yesterday's incident -- mercury exposure can cause lung or heart damage, officials said.

"About 1 ounce of the liquid was spilled, said Tim Paschal, assistant superintendent of the Central Kitsap School District. He said 10 sutdents touched the liquid and 14 others students and two staff members received 'indirect contamination' by touching the students or inhaling fumes.

"All 26 people were given emergency showers and fresh clothing. The items they had worn were placed in bags for testing or possible cleanup by a contractor, Paschal said.

"All classes will resume today. The classroom where the spill occurred will be closed for cleaning, Paschal said."

(Learn, from page 2)

in the trade as well as the success stories.

IF anything in the answers you get makes you nervous:

Check it out with people in the trade; several grand of your money and weeks or years of heartache are at stake. Check with the Better Business Bureau, and any accreditation agencies that monitor the school.

And IF you decide to enroll:

Read "Neon Techniques and Handling" before you even start the course. There are many things that are outdated in this book, and you can skip the section on fluorescent lamps, but it will give you a good basis to work from.

When it gets too technical, just skim over it, but keep a notebook next to you as you read to jot questions as they come up. This may seem dry, but it is the bare theoretical bones of what you'll be learning. When you start school this'll give you more time bending glass, so you spend less time asking basic questions.

When school starts, consider it a full-time job. Go every day. Spend as much time at the bench as possible. Be a drudge. No long lunches. Stay late if you can. Don't judge your performance by high-school standards, where as long as you do better than the average student you're doing okay. You're likely to be paying around a hundred bucks a day, and it's no bargain if you're out smoking and schmoozing.

The only exception to this rule is the time spent getting ancillary skills like wiring and equipment maintenance. Most likely, sooner or later, you will be running a sign company's glass shop, or at least helping in more areas than bending. So ask for this stuff, unless you really intend to spend the rest of your life in a factory setting.

Take notes endlessly in class. Make diagrams and jot down ideas and questions, then pester instructors for the answers and write them down. There's no possible way to remember all you're hearing; I often think of neon as "the art of ten thousand details." When you get stumped on the job -- and you will -- you'll have something to turn to.

And don't expect too much. Even the best six-week course will give you the bare basics, but not much more. This is a craft, not a hobby, and around the rest of the world people still learn it as apprentices, studying for years and not mere weeks.

(To my knowledge there are only two schools of longer duration -- the British School of Neon, located at the Masonlite factory in England, and at a public technical school in Detroit Lakes, Minnesota. Oddly, both of these schools charge much lower tuition than the short-term schools. Check them out if you can spend some months in an exotic locale.)

IF you still seek neon work after your "trial by fire":

Unless you're a prodigy of hand-eye coordination, you can expect about a year of frustration wherever you work; longer if you don't work full-time. The first several months will be hard on your self-confidence, because you won't be producing neon of consistent quality, and you'll be painfully slow.

The ups and downs are pure hell: You'll have a really good day or two, and think "okay, I've mastered that bend now," but then the next day it'll turn to shit every time and you're twice as frustrated because you think, "But I know how to do it!"

Go to work for someone else after you graduate. Immediately starting your own shop is a recipe for disaster and struggle, not to mention putting more poorly-made neon out into the world (there's enough already).

An ideal first job is one that won't pressure you -- the glass will drive you crazy enough. One way to get this is to be paid only for what you produce. This is rough if you need money bad, but at least no one will fire you for being slow.

And try to work with another bender, not just in an empty shop or off-hours. You need to keep learning and there's nothing better than someone there to help you. Ideally they didn't go to the same neon school as you; there are different ways to do the same simple thing and it helps to be able to pick and choose techniques.

Helpful too is a bare, hard wall with a trash bin below it, onto which you can launch your frustrations.

IF you want to keep learning beyond the first year:

Cultivate neon friends. If there's no one in your area who'll talk to you (which is often the case; why should they share anything with the competition?) try to meet people in other locales. Go to trade shows. Write letters or call other sign people when you hit an odd snag; get the names of knowledgeable folks from the trade magazines.

Visit shops wherever you travel; consult the yellow pages and call a few days ahead to ask if you can stop by. And keep in touch with your classmates.

Find someone with a collection of Signs of the Times magazine and scan every issue from the last ten years. Read everything on neon and take notes from technical articles. This gives you an idea what the established craftsmen in the field have been struggling with, where progress has been made, and other ways of doing things.

And go beyond the sign trade for answers. Be prepared to learn some high-vacuum science and a bit of electronics. The more theory you have, the better you can cope with some new problem coming up (and there is always something new coming up).

I don't mean to sound so negative about learning neon, but I think it's best to give some warning. Otherwise there are people who expect a skill to be handed to them when they plunk down their $4000, and they get a rude surprise after graduation.

Neon training is only what you make of it, and you've got to get in there and bust your butt to make it work.

(Europe, from page 1)

sizes. I said, "It's like trying to ride a bicycle with one leg -- it only works halfway," but trying to appeal with some kind of Dutch analogy didn't help.

For one, I'm used to revolving the glass only 180 degrees, in either a crossfire or "cannon"-style crossfire. Here it's one point of flame, big and bushy, and pointed upward at 45 degrees. The glass glowed orange, turned black and then some attempted bends came out all chiselled and rough-looking, due to uneven heating.

Also the way glassblowers here follow the paper pattern is to hold the hot glass in the air close above it. I use aluminum screen at home, and requested some for this "demonstration."

The stuff doesn't exist here. They didn't know what I was talking about. There are no screens on any windows anywhere. Bugs do indeed exist here but they aren't excluded from open windows.

So I said, "I'm afraid I'll burn the pattern paper," and they said "Don't worry about it -- it can take a lot of heat -- just do it as you do it." After starting a fire on the first bend I attempted the local technique, holding it in the air and getting a very un-flat, unaligned piece of glass.

Also the use of blowhoses is limited. The only one available for the demonstration was about fifteen feet long, and I wound it over my shoulder a few times to take up the slack, but it still drooped all over and got in the way.

My self-image at this point looked something like Charlie Chaplin in "The Tramp." I tried and tried and no amount of playing

(see More Europe, page 6)

Out of the hot tub, into the soup: Cheap air!

By Telford Dorr

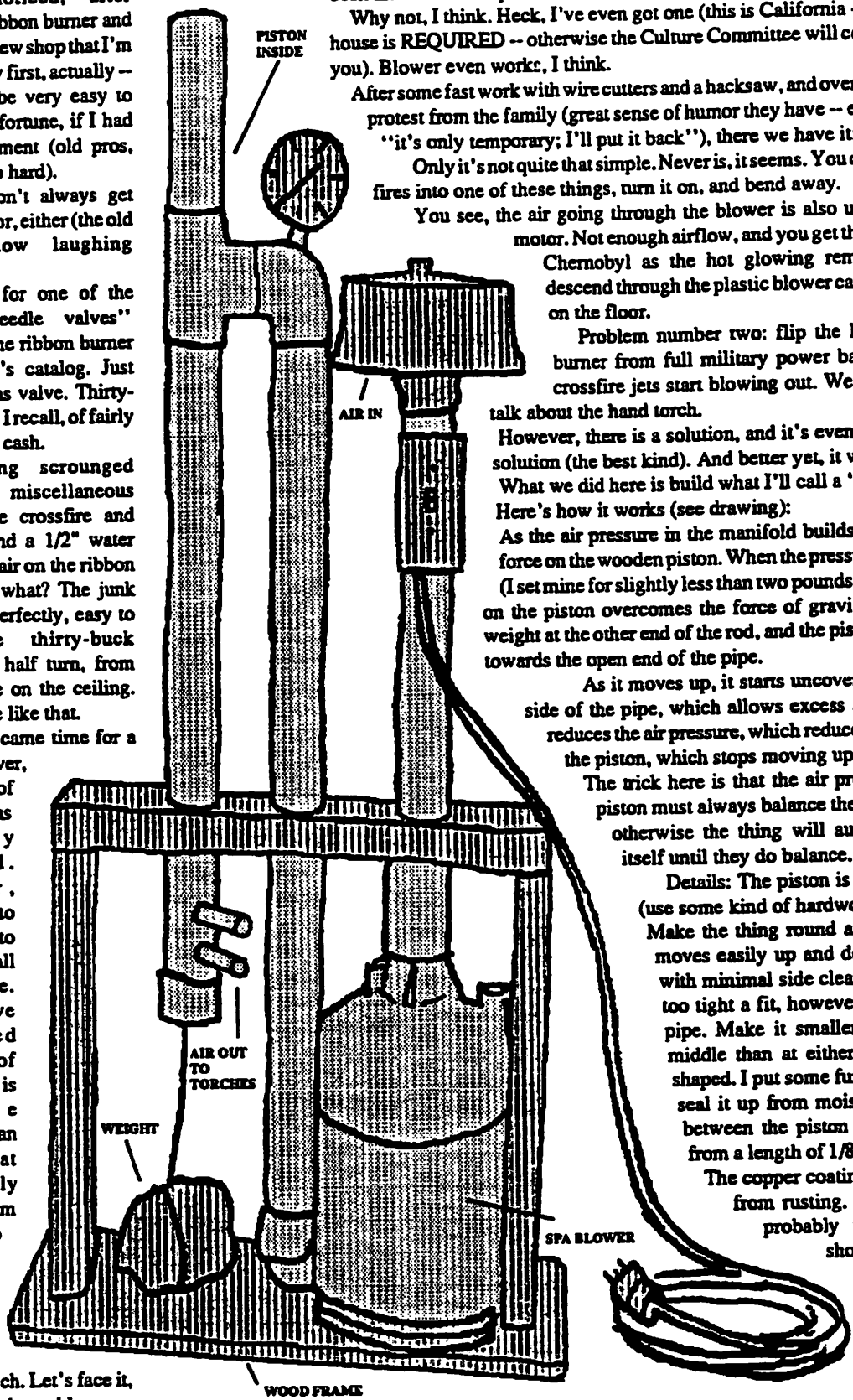
I have noticed, after purchasing a ribbon burner and crossfire for a new shop that I'm setting up -- my first, actually -- that it would be very easy to spend a small fortune, if I had one, on equipment (old pros, don't laugh too hard).

And you don't always get what you pay for, either (the old pros are now laughing hysterically).

I suckered for one of the "precision needle valves" specified for the ribbon burner in the vendor's catalog. Just one, for the gas valve. Thirty-some bucks, as I recall, of fairly hard-to-obtain cash.

After using scrounged oddball and miscellaneous valves for the crossfire and hand torch, and a 1/2" water gate valve for air on the ribbon burner, guess what? The junk valves work perfectly, easy to adjust. The thirty-buck wonder? One half turn, from full off to fire on the ceiling. Some days are like that.

So when it came time for a proper air blower, the concept of "buy new" was rapidly dismissed. However, whatever was to be used had to work right -- all the time. Nothing I've experienced this side of classic glass is more frustrating than fires that intermittently blow out from being too lean, or reduce the lead out of the glass from running too rich. Let's face it, the fires gotta be stable.



I had an instructor at UCSD Craft Center's School of Neon, Ceramics, and Other Fun Stuff (Fish Painting???) mention that some sign shops have been known to use spa blowers for their air source.

Why not, I think. Heck, I've even got one (this is California -- a hot tub at every house is REQUIRED -- otherwise the Culture Committee will come and speak with you). Blower even works, I think.

After some fast work with wire cutters and a hacksaw, and over minor whining and protest from the family (great sense of humor they have -- even bought the line "it's only temporary; I'll put it back"), there we have it: cheap air.

Only it's not quite that simple. Never is, it seems. You can't just plumb two fires into one of these things, turn it on, and bend away.

You see, the air going through the blower is also used for cooling the motor. Not enough airflow, and you get this baby imitation of Chernobyl as the hot glowing remains of the motor descend through the plastic blower case and start working on the floor.

Problem number two: flip the lever on the ribbon burner from full military power back to idle, and the crossfire jets start blowing out. We don't even want to talk about the hand torch.

However, there is a solution, and it's even a reasonably cheap solution (the best kind). And better yet, it works!

What we did here is build what I'll call a "bypass regulator." Here's how it works (see drawing):

As the air pressure in the manifold builds up, it increases the force on the wooden piston. When the pressure gets high enough (I set mine for slightly less than two pounds), the pressure acting on the piston overcomes the force of gravity pulling down the weight at the other end of the rod, and the piston starts moving up towards the open end of the pipe.

As it moves up, it starts uncovering a slot cut in the side of the pipe, which allows excess air to escape, which reduces the air pressure, which reduces the force acting on the piston, which stops moving up the pipe.

The trick here is that the air pressure acting on the piston must always balance the force of the weight, otherwise the thing will automatically readjust itself until they do balance. Piece of cake.

Details: The piston is a 3" length of wood (use some kind of hardwood; it works better). Make the thing round and smooth so that it moves easily up and down inside the pipe, with minimal side clearance. Don't make it too tight a fit, however, or it'll stick in the pipe. Make it smaller in diameter in the middle than at either end: sort of spool-shaped. I put some furniture oil on mine to seal it up from moisture attack. The rod between the piston and weight is made from a length of 1/8" of gas welding rod. The copper coating on the rod keeps it from rusting. A coathanger would probably work okay, after a short session with a pair of pliers and some sand-paper.

Drill a 1/8" hole through the center axis of the

(see Cheap air, page 8)

Foreign goods worth going the distance for

Available in Holland are "Eurovac" glass manifold components. Their line include teflon-stem O-ring-type stopcocks in sizes 9mm through 16mm, in either "Duran" (pyrex) glass or "AR" (soda) glass.

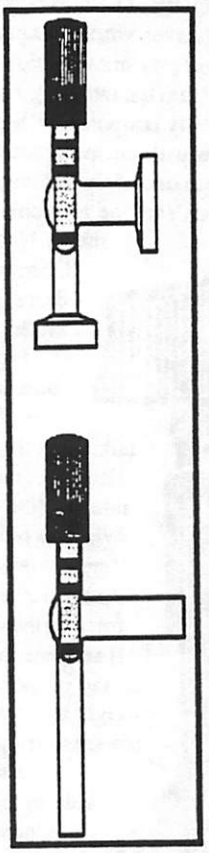
These are available with or without glass NW-KF ends (!), making connections to a metal NW-KF system quite simple. You do need to use Pertinax clamps for this, however; a standard metal O-ring clamp isn't wide enough. These clamps are available through them or from companies in the U.S.

There are also glass "T" connectors, crosses, reducers and so on all available with the glass NW-KF ends. Everything is available in Duran glass; the AR glass is limited to the stopcocks without the NW-KF fittings, and also to blank glass stubs with an NW-KF fitting at one end. With these, you can make up any system to your heart's desire in lead or soda glass, weld one on the end, and connect it to a metal system, such as your gauges or pump.

The company to contact is:

J.H. Ritmeester B.V.
Nieuwe Gracht 201
3512 LN Utrecht NETHERLANDS
Tel. (030) 316-422
Fax: (030) 331-179

Ask for a catalogue and price list for Eurovac components.



From Ritmeester catalogue

When you use a milliampmeter to test the load on a neon transformer, you are using an indirect method to determine what the voltage should be. This is, I suspect, because milliampmeters capable of operating at 15 kilovolts are a lot easier to come by than voltmeters.

But if you ever wanted to use a voltmeter for this, here's a source:

Combi Agents
Postbus 239
1600 AE Enkhuizen NETHERLANDS
Tel: (31) (022) 801-7464
Fax: (31) (022) 801-4110
Attention: John K.A. Nieuwenhuis.

Their model with a combined ammeter and voltmeter (three ranges, up to 10 kilovolt) is 700 guilders (about $400, depending on how badly the dollar is doing as you read this). The voltmeter is protected against open-circuits (you'll not fry it by accident). I asked Mr. Nieuwenhuis if they could have available a 15 kilovolt model, without milliampmeter, for the American market; he said yes, but only in quantities of 100. (The price in such quantities is 250 guilders each; any interested dealers?)

The way to use one of these is: 1) Use a transformer of higher voltage than is required for the sign (a 15,000, say) and use it for all testing. 2) Place the meter's leads in parallel with the neon (in other words, two clips to the transformer's high tension output), to take a reading. What you'll see on the meter is the required operating voltage. Since a higher voltage is required to first strike an arc across the tube, the calculation for transformer size is as follows: multiply for blue tubes by 1.25, red tubes by 1.5.

A final bit of Christmas tinsel: **Neon Products** of Aachen, Germany, sent the workshop the nicest little promo gifts we've seen: two silver coffee spoons topped with delicate European-style neon torches. We wonder: how much glass must one order to get a set? They're a chic item to serve the office brew to customers with (though, admittedly, many customers don't even know what a torch looks like...).

(More Europe, from page 4)

with the flame settings yielded me anything decent.

Mr. Sproet speaks little English (he's 74 and has been a bender all his life) and at that time I had zero Dutch (nowadays it's maybe 40 words). So he looked rather skeptically at this inept person who confirmed all his suspicions about Americans and lead glass both, and occasionally came over to push my hand a few inches into or out of the flame.

It was a fine start for lead glass in Holland.

Amsterdam is a fairly sexual place. The red-light district is world famous, and the locals seem pretty jaded and bored by what keeps the tourists gawking. (The big difference from American sleaze is the bored women standing behind red-lit windows.)

One local neon person told me of going to Paris with his wife and staying at a hotel in a similar red-light district. While waiting for his wife to catch up with him, he noticed that the neon in one window was wired with bare electrodes and no insulation.

He pointed this out to his wife when she arrived, and she said, "You're not supposed to look at the neon, but at the naked girl!"

He hadn't even noticed her.

I spent two days with Hein van de Water, a glass person of multiple talents in Groningen (two hours north). His main business is restoring stained glass in churches, and he has expanded into cold glass work, mirrors and neon; his company name is Lunacy Unlimited. He is also the Netherlands dealer for a German brand of solid-state transformers. We drove to the annual sign show in Hamburg and swapped lots of stories on the way.

Hein had a two-in-one neon unit hanging in his shop. There was a larger-diameter tube pumped blue, and inside it (with the glass to the electrodes passing through its side wall) was a second tube, pumped neon. The outer, blue gas was continuously lit with one transformer; the inner, red tube faded on and off with a second transformer.

I said "Hein, that is a very interesting tube. Not because the idea is that unusual -- I had it myself once -- but because you did a very good job with it. I was never able to make one."

"Stop. Don't tell me that," he said with a smile.

"No, it's true. It is superbly crafted."

"No, it's not."

"Yes, Hein, you did a very nice job," I said, laughing.

"Let me tell you a story," he said. "Some years ago I went to the all-Europe sign show in Germany, and I brought that piece with me, just for some fun.

"I did it to see who were the glassblowers there. People would walk up and look at it and immediately I could tell. If they were glassblowers they'd bend down close and look carefully all around it, and if not they'd just sort of look casually at it and say, 'Oh, that's

(see Baby neon, page 10)

What's the difference? Euro-neon explained

Neon Workshop Amsterdam is set up on the premise that precoated lead-glass neon techniques have merit. There are many doubters and skeptics here since no Netherlands shop currently uses "American" techniques, so I've had endless opportunity to engage in "why this is better or that is better" conversations.

Here's a short description for those who aren't familiar with Dutch- and German-style neon (see also Michael Blazek's article in NN#6):

The pumping can be quite different, using an oven and an electrode eddy heater instead of bombardment; also, the lack of a high-vacuum pump, be it diffusion or turbomolecular, is unheard of. But there are two major differences, which are the glasswork itself and the way the powder arrives in the tubes.

The glass is all soda-type, known locally as "AR," and most neon is 18-25mm. The bending is done with only uncoated glass and in a much slower, more precise manner. A 90-degree bend takes 10 minutes or so and comes out with a perfectly sharp inside and outside corner. Even a 135-degree bend has a nice sharp point on it!

A "double-back" bend here is done in two steps, 90 degrees at a time.

Once the glass is bent to shape, and before the electrodes are put on, the powder is added.

There are two different systems for this: "dry powder" and "wet powder." The wet powder system is considered better, but it is more difficult and it requires a baking oven.

I briefly visited one shop that uses this technique, and although I didn't see the powdering done, I got a glance at all the apparatus for it. There were plastic jars with the wet suspension solution inside, each one containing a different color, and to keep them all mixed the jars rolled continually on spinning pipes laid parallel to each other.

In another corner of the shop was a giant oven with a top that lowered down via cables and pulleys; finished tubes had to fit in this oven for bombarding.

The dry-powder system I saw demonstrated. The steps for a bent piece of glass (without electrodes) are:

1) run acid through,

2) run water through to clean out the acid,

3) when dry, run through a sponge dipped in acetone (using pure compressed oxygen to push it along),

4) when the acetone is dry, run another sponge through with binder solution in alcohol, again pushed along by oxygen,

5) dip the end of the glass into the jar of powder, to pick some up into it,

6) tap the powder evenly through and put the rest back into the jar.

Needless to say, both wet and dry systems are time-consuming. One two-foot-long straight piece of glass took 45 minutes to coat with dry powder.

The resulting appearance is quite different, and one can tell at a glance whether a given piece of neon was made here or elsewhere.

The height on a double-back can be tiny, next to nothing. The corners are corners, dammit, not some rounded-off close-enough affair.

And since the powder is never subjected to the heat of the torch, there is nothing to break down, mix with mercury and turn black (you don't see staining except on very old tubes). Colored glass is used commonly too, generally from Germany, but Italian Technolux glass is making inroads.

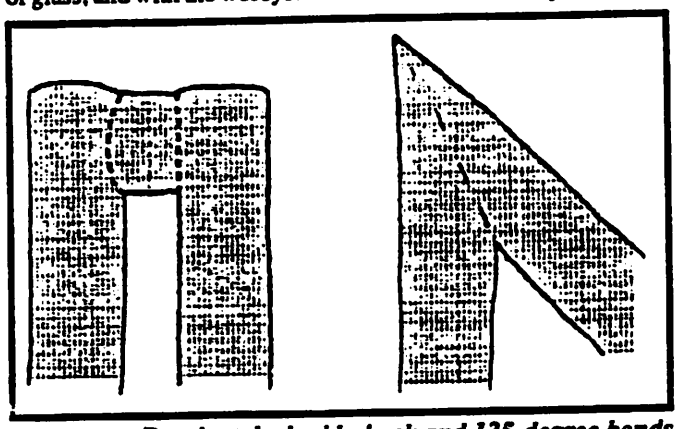
There is never a weld discoloration to be seen, of course -- the welds are as perfectly powdered as the rest of it.

Does this difference justify the extra time and expense? Sometimes it does; one person pointed out that blue lines at welds are very noticeable in neon on television; cameras are sensitive in the blue range and overrespond to it.

Which is not to say that all neon is perfect here. Frequently on the street I see signs that are of mismatched colors (three or four shades of pink-orange, for example), and even more frequently the difference in brightness of adjoining tubes is distracting.

I heard from one person that with the wet system the brightness is reduced to half in one year, and then stays stable after that. Also with that system, the color of the unlit tube turns from white to tan.

With either system it is a lot of work to have two colors on one unit of glass, and with the wet system there are sometimes spots or dark



Dutch-style double-back and 135-degree bends

areas where the powder buildup is too heavy. I spoke with some artists here who are interested in trying precoated glass because the spots were quite noticable and "look like dirt or something."

(On the other hand, Jan van Munster, a well-known Dutch artist, was in San Diego recently and tried using locally made neon for a sculpture. Because he needed a long, straight line without any visible welds, the only thing he could do was have the glass made in Holland and shipped over.)

Neon Workshop Amsterdam is set up as a production facility where Europeans can get a good look at lead-glass techniques.

It's a showplace -- centrally located, spacious, clean, high-tech, with a killer view of the harbor -- and judging from the interest so far, it will promote both lead-glass neon and neon in general here.

Many European neon artists have never bent a tube and often have little exposure to the technical details of production beyond their specifications; some visiting artists have stayed and talked for hours at the workshop.

And the small, cluttered family-owned workshops where both artists and big sign shops buy their neon (few have their own neon plants) have never had any reason to welcome in or educate the public. The workshop will offer presentations and tours to architects, designers, and any others interested in neon.

The partnership consists of Peter Mason (still advising Masonlite, though he sold it), and Rob Nolte, Frans Buis and Karel Gooren, who own major Dutch sign companies without in-house neon plants.

Now the bad news: The workshop's first big order is 200 identical small signs that say "Let's Bokma" (Bokma being a brand of booze). This is novel enough in Europe, perhaps, but not what I had in mind when I heard "creative projects... artists... new applications for neon..." and so on.

There's a silver lining in such repetition: it allows perfectionism. Like modifying paper patterns to include all the pertinent data (like

(see Workshop, page 14)

(Cheap air, from page 5)

piston for the rod. While you're at it, drill a 5/64" hole in the bottom pipe endcap for the rod to pass through.

Bend the end of the rod so that it can't part company with the piston. Drive a small finishing nail into the piston, down alongside the rod to wedge it (this shows the piston that you're serious about it not leaving; also keeps it from sliding down the rod toward the weight when you shut the blower off).

All plumbing was done with 1-1/2" schedule 40 PVC water pipe and fittings. The slot in the pipe was cut with a 1/8" Dremel Tool bit, chucked up in the power drill. Don't use the Dremel motor; it turns too fast, just melts the PVC into a gooey mess.

Make the slot about 4" long. Note that most PVC pipe isn't terribly round or smooth inside. I cut a slot in a short length of wood dowel stick to hold a strip of sandpaper, chucked the creature up in the power drill, and used it to spin-sand the inside of the pipe smooth.

The frame to hold the whole beast was made from pine 2-by-8 and plywood. Trick: cut the three holes in the top piece of 2-by-8 the size of the outside diameter of the pipes, then rip saw the wood in half lengthwise; remove about 1/4" of wood. Use two 3" long 1/4" diameter lag bolts to tightly clamp the wood halves around the pipes.

The 1/4" plywood corner braces give the whole structure strength. A coat of your favorite wood finish gives it beauty (also keeps spilled beer from soaking in).

The design of the weight I leave up to your imagination. I used a rock that in a previous life was the shop doorstop. Just make sure that, when complete, the piston's lower edge completely covers the slot in the pipe when the weight is resting on the base and completely uncovers the slot before the weight hits the bottom pipe cap. Adjust the weight to get the air pressure you want.

Caveat: While this setup works great, there is a potential problem of the big and bad kind. However, it is easy for the THINKING person to avoid.

The problem is this: The motor used in a spa air blower is what is called a "universal AC-DC" type of motor. It is a close relative of the common household vacuum cleaner. It has brushes and a commutator and such.

All motors of this type spark at the brushes slightly when running (look at the back of the motor in your power drill for a demonstration of this).

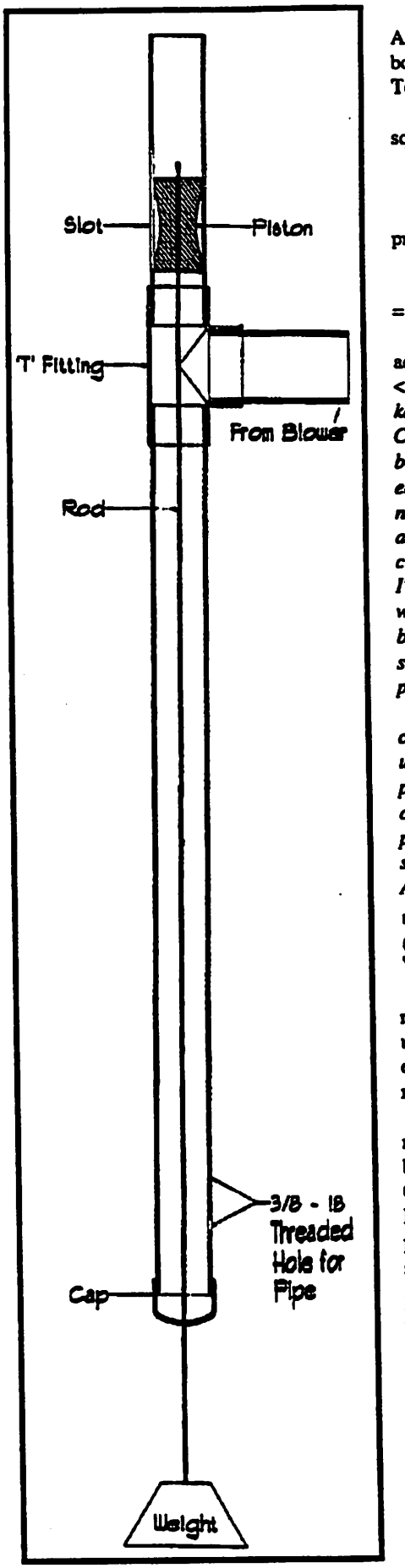
WHATEVER YOU DO, NEVER EVER allow gas from the burners to get back through the air plumbing into the blower motor. Otherwise, you're 6 o'clock news.

To keep the above from ever happening, I added a common electric gas valve, like the ones used on your household forced air furnace, to the supply pipe for the fires.

You can also probably scrounge one from a deceased gas clothes dryer, although I haven't checked this out.

Add the electric valve after your main gas shutoff valve. Wire the input of a standard 11-volt doorbell transformer in parallel with the blower motor. Use the output of the transformer to energize the gas valve.

If you ever inadvertently shut off the blower or lose electrical power while the gas is on and the fires are running, the gas will be automatically shut off. End of problem.



So there it is -- True Cheap Air. Now for a cheap bombarder. Stay tuned.

Technical Info:

Area of Piston = pi x radius squared

= 3.14 x 1 x 1

= 3.14 square inches

Force on Piston = 2 PSI (air pressure) x 3.14 sq. in.

= 6.28 lbs.

therefore, weight of weight = 6.28 lbs.

For a different air pressure, adjust weight accordingly.

<Editors' note: Telford Dorr keeps his hot tub in Encinitas CA, and also writes: "I've been using the described equipment for many months now with excellent results, and as it was so easy (read: cheap) and simple, I thought I'd share it with you guys... Am working on a do-it-yourself bombarder project and will send details as work progresses.

"Have worked out an easy circuit for a high-frequency unit for driving single-ended pieces." Stay tuned for this one in a future issue... And please pay attention to his safety advice if you try Cheap Air a la Dorr.>

Stress test

"One of the most remarkable exhibitions of unfailing performance by an electric sign was given in a recent San Francisco fire.

"For several hours the fire raged in the building occupied by the Kehoe Display Fixture Company on Market Street... For four hours, five high pressure streams of water spattered against the building and also against the Claude Neon electric sign which never for a moment dimmed.

"It advertised its owners brilliantly to the crowd that gathered to watch the spectacle."*<That was some consolation to them, we're sure.>*

-- Claude Neon News
September 1929

The man without fingerprints: A case of thermal shock...

By Bob Lind

Regarding Mark Snyder's statement that oven annealing is never equalled by flame annealing: It may be true, but I've either had an awful lot of luck flame annealing or I am doing something right.

Most of my large jobs (13-18mm) are bent on oak wooden strips, approximately 3/16 of an inch thick and an inch wide and 4-8 inches long, bending over flammable pattern paper.

This reduces the use of non-bestos (very expensive, I'm told) but the big advantage is the elimination of most of the thermal shock. (My apprentice, Dave Turner, says thermal shock is when he grabs some hot glass. His first few weeks, Dave had no fingerprints, just nice shiny fingertips, but he's doing fine now.)

The down side of this method is the burn marks from the wood after a ribbon burner sweep. But that is easily wiped off if required. Also, with a little practice on the location of the strips of oak, you'll eliminate the sags that may occur with ribbon burner work.

I still use non-bestos with smaller, more exacting jobs, and do anneal liberally whenever I've any doubts. I've been able to file cut within an inch of tubulations that were done with a crossfire and get a good clean cut. I've been able to bend imported colored glass with no more problems than lead glass.

The first thing you teach an apprentice is to re-tubulate, so when he knocks one off of your tubes during processing, guess who re-tubulates? With proper soft-fire pre-heating, Dave's done great.

A few guidelines for strain-free tubing:

1. Avoid thermal shock whenever possible (Dave agrees);
2. Never force the glass; reheat if necessary to properly align it;
3. Anneal with a soft flame (cut back on air) several inches beyond the bend;
4. Air-cool bends and tubulations;
5. Pre-heat with a soft flame when working near bends or tubulations.

Boy, when I get going, I keep on ramblin' on, but I keep hearing quite a few benders seem to be having strain problems. I've always believed that the critical area of a tube wasn't at the bend itself but the area adjacent to the heat, where the temperature was less than the annealing temp. Incidentally, I learned the trick of bending on oak strips from the method used in Germany, although they used asbestos blocks. While on the subject of Germany, I believe they're on the right track with lower-voltage transformers and higher M.A.

But at least we're beginning to accept mid-point grounding. I still believe we should be maxed out at 10K transformers.

I think the American neon component manufacturers had better become innovative or they'll find themselves in the same position as the auto industry. Their packaging system is a joke and availability of some items is as the discretion of your supplier (I use the word loosely). We're starting to use more Masonlite products as well as Eurocom products.

That's about it for now and keep up the good work.

<Bob Lind is an alumnus of Egani's Class of '47, and presides over the fires of Tri-State Signs in Windham NH. The above advice came in a letter in which he wrote, "I am amazed at the wealth of knowledge available today compared to several years ago." But what we find hardest to get is precisely the perspectives of longtime benders. So all you veterans, send us more wisdom!>

Fresh letters

More from Edward DeZuzio, the Shadowmaker of Jersey:

...I too have been using the 07s (7mm electrodes) and found that they can be bombed with a 12kva 600 ma trans and variac.

Brian and I were working on a model of a shopping mall with Claudia Klien and George Phiefer and it called for some illumination. Claudia and George are proposing a GIANT kinetic sculpture to hang from the ceiling in the mall's center. A bunch of 12-foot-tall-by-18-to-24-inch-diameter helix-looking things with luminous tubes inside and cloud pods also illuminated with tubes.

Everything is hung like mobiles and the helixes are similar to a carrousel, traveling around a track in a circle and going up and down -- a cool look I'd say!

I'm sure if the art is accepted by "the money men," the full-size version will be easier to engineer than the 1/12 scale model.

The model called for four-to-ten-inch 8mm tubes (pink and purple) and a total of 40 fabricated. To splice the electrodes to the glass I used my large hand torch as a crossfire. The heat was much easier on the fingertips. When it came time to bomb I was going to use "the black box" but decided to use the bombing trans. This is what I found:

Everything is hung like mobiles and the helixes are similar to a carrousel, traveling around a track in a circle and going up and down -- a cool look I'd say!

The most trouble came from the 7mm electrode shells being too close to the glass. The first dozen units wound up with star cracks, broken electrodes and holes near the trode shells.

What needed to be done was to straighten and center the shell and glass. I had to remove one trode from each unit and employ a coat hanger to do this. It took a lot of time, so if you plan to work the 07s, this should be the first step.

O.K., back to the bombing table (three hours and six phone calls later). You want to clean and degrease your stopcocks for this. My manifold has a 10mm 0 bore stopcock and with a steady turn it pulls more than a sufficient amount of air from the tube. My estimate is a 2 second exposure of bore to arm. For the units with an overall length of four inches from trode to trode -- BE CAREFUL if you are using a temp gauge. There was some arcing from the bombing leads to the probe clamp. I found paper to be safer to work with (I used my competition's yellow page ads).

Most units ran 200 ma to start. I bombed until 100C and spilled my coffee -- I mean stopped bombing and opened the main stopcock -- bombed again to 125-150C for 7-10 seconds (with stopcock open). At ten seconds on the longer units the trodes were evenly red and the temp climbed to 200-225C.

Since the colors had to be pink and purple hues, there was some gas mixing goin' on in the clear tubes. I referred to Spring '90 issue: ladle the neon first and then the argon (no. 50 blue in this case). Some very "steel" tones can be achieved this way:

2mm neon, 13mm argon = light grape

4mm neon, 11mm argon = red pinstripe with purple halo

3.5mm neon, 11.5mm argon = thinner red pinstripe with purple halo

1mm neon, 14mm argon = brighter and similar in color to straight argon (no. 50 blue)

Found that satin-clear Krylon or equivalent will make the color

(see Edward's letters, page 12)

Motel madness: Can you solve this one?

By Tom Tokarski

May we ask your help to solve a television interference problem that is stumping us?

Let me describe the circumstances: A local motel recently asked us to remove and replace silhouette neon letters on a gable above their office so that new vinyl siding could be installed.

The letters, which are rose-colored 15mm neon, span about 25 feet across the gable area. The letters are "Paradise" in script and "INN" in block, and are mounted to "plymetal," which is sometimes used as letterback material for channel letters.

Standard tube supports secure the neon to the plymetal and aluminum standoffs are used to anchor the plymetal letters to the gable.

Television receiving static is on cable and plugs into an outlet on an inside wall about ten or twelve below exterior neon on gable. The outlet is on a different breaker than the neon.

Before the vinyl siding was installed, no reception interference was evident; since the siding was put up, distracting horizontal lines appear on the television screens.

Two transformers, a standard 15-30 and a standard 5-30, operate the neon; they are in an attic behind the gable wall. When just the 5-30 is operated, the interference is minimal, but it is much more evident when both transformers are operated.

When a voltmeter reading is taken, a 100-volt drop difference is noted between ground and transformer box, and between ground and letterface material. Secondary wiring to glass from transformers is GTO in no conduit going through standard slipsticks to outside.

We attempted to ground letterfaces by running ground wire to letterfaces outside from metallic conduit ground inside attic, but still record a 100-volt difference in drop.

We also attempted to insulate aluminum letterface anchors into wall by removing letters and adding a nonmetallic PVC spacer between the aluminum and the interior metallic foil of the new siding, but again the interference on screen continues.

We have also experimented with replacing the two standard transformers with new standard transformers, and that had no effect. Nor did trying two Neon Dynamics solid state transformers. And we have moved the transformers away from the gable wall where the neon is, to no noticeable effect.

We have thought that a field is being set up between the foil of the new siding and the plymetal letterfaces that captures any radiant voltage from the neon and causes the interference, but this is only a theory.

The day we removed the letters something happened that may or may not be related to our problem:

The men on the job simply pushed back the GTO feeds and glass tubing or slipsticks into the wall before the siding was put up, for our plan was to return the next day to replace the letters in the same position.

But after the men left and the new siding had been installed, a fire started that luckily one of the vinyl installers noticed, and immediately ripped off the new siding area and extinguished.

We believe someone may have turned on the switch to the neon by mistake and that the GTO contacted with the siding foil and ignited it. (Our men should have taped the switch, but didn't think to do it.)

But to this day we really do not know if the switch was on or not, because the motel personnel knew what was going on and wouldn't have turned the switch on.

At the same time the fire was igniting, the motel's telephone system was disrupted, although none of its wiring is in proximity to the neon on the gable.

I even suspected a lightning strike; it was stormy at the time, and the power company recorded some line power surges in this area of town. This incident may or may not have anything to do with the television interference problem, so I mention it in case it gives someone a clue we might have overlooked.

We will be very grateful for any suggestions you may have to help us troubleshoot this problem further.

<Tom Tokarski writes from Parco Neon in Livingston MT.>

(Baby neon, from page 6)

interesting,' and move on.

"So I'm feeling pretty damn proud of the thing, and then this guy from Belgium walks up and says, 'Baby neon.' I asked him what he meant.

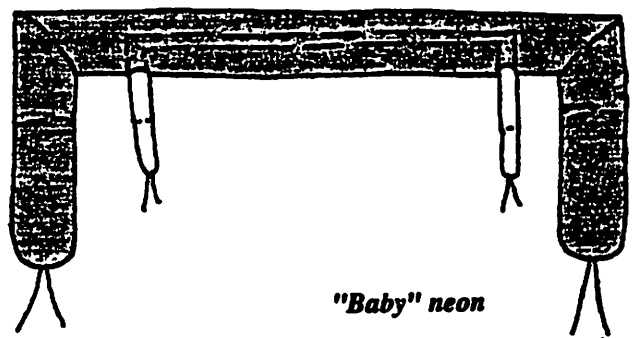
"He said, 'We used to make those all the time, after the war. We'd bend really small letters and then put them inside a large outer tube. We called it "baby neon".'

"So after that I'm not so proud of my little tube. Baby neon!"

Two things I learned from Hein: To make a "twist tube": take a 15mm piece of glass and heat two sides of it on the ribbon (not all the way around). Blow it out a little and then suck in, and immediately twist it around and around. It should make two chambers, oh, 6 or 7mm in diameter, on the outside of the twist. Anneal very carefully over the flame; oven bombard. When lit the arc will only go on one side; it will switch over to the other side when that side is touched.

A way to use a regular air compressor for neon torches, instead of a blower: Have a good-size tank on the compressor and use not one but two regulators, stepping it down in succession -- the first to about 15 psi, the second to 1 or 2 psi. This eliminates any pulsing from the compressor.

Hein calls ruby red glass "lead glass." I said wait a second, we call it soda glass. He said, "I know. But we consider that the colored glasses handle much more like lead glass than our regular clear soda glass."



"Baby" neon

The German sign show had about seven displays of interest to neon folks:

Masonlite had a glass and transformer display; Neon Products had electrodes plus their constant-current sci-fi pumping and bombarding system (I consider it the world's finest, but who has thirty grand for a pump station?). There were a number of transformer and glass companies, and the French company Sefli also had a pumping and bombarding unit, which of course I poked

(see Hamburg, page 11)

Defy gravity with mysterious plasma tube

By Jeremy Storm

"Anti-gravity" plasmas may be generated using the following technique:

Blow a 25mm bubble in a 15mm tube. Heat the 15mm tube near the end and pull-shrink to about 8mm ID. Crush the glass from a pair of EGL-07 mini-electrodes. Insert the shell into the reduced end of the tube and weld the dumet using hand torch.

Pop a hole in the side of the tube and install a 5 or 6mm tubulation. Heat the 15mm tube 3 or 4 cm away from the installed electrode and pull-shrink as before. Install the second electrode, making sure the shells are centered and separated by only 2cm. The tube will now look like a small lemon with a dumet lead out each end.

Bombard slowly at about 199 ma or less, with air pressure between 10 and 100 torr. No need to reduce pressure to heat the electrodes, as they will reach the correct temperature even at 10 torr or more at this current. The EGL-07 is tiny and delicate, so be careful to prevent the dumet leads from melting. After bombarding, backfill with neon to 130 torr. Tip off and begin cleanup at 30 ma.

Many hours may be required for cleanup <curing>. Periodically try running the tube on a Tech 2000 RF supply. Eventually the "red thread" will form and vigorously arc away from the earth.

This effect will appear only if the tube is powered by a radio-frequency supply such as the Tech 2000. It will not work on 50 or 60 hz.

As the tube is moved back and forth, you should notice the plasma pointing in the opposite direction of the vector sum of the applied force (acceleration plus gravity).

The exact mechanism of this observed phenomenon is not known to this experimenter. Any reasonable explanation would be greatly appreciated.

Crackle lamps: Install an electrode of your choice on one end of a 25mm tube. Cut the tube to a length of not more than 30 cm. Fill the tube with glass shards ranging in size from 1 to 2 cm. Install the second electrode as usual.

Bombard slowly and occasionally turn the tube over to help heat it evenly. Fire the electrodes in the usual way. Backfill to 150 torr with your favorite color (no mercury please) and cure in at 30 ma.

At this pressure the plasma will be in the form of a thread and will slowly wander around the inside of the tube. The plasma may be made to rapidly jump around by connecting a high-voltage diode in series with the tube. I use a 1 amp 14kv diode. If the plasma is too "nervous" to watch comfortably, then remove the diode.

I used phosphor-coated glass shards with argon only to produce a beautiful, colorful effect.

The plasma will not wander using a radio frequency supply. Use a core-and-coil transformer on 50 or 60 hz.

(Hamburg, from page 10)

around and pawed at awhile.

This system is all stainless steel with Edwards gauges and Alcatel pumps. The high-vacuum pump is a metal-body oil diffusion pump. When I asked about turbomolecular units they said they didn't like them because of the possibility of breakage with use.

Which brings up high vacuum systems here. In Europe the use of a forepump alone is inconceivable. One person I talked to said he couldn't believe it when he was in the States -- "Nowhere! Not one! Only forepumps, no high-vacuum pumps!"

Unfortunately, the most popular type is the mercury diffusion pump, whether glass- or metal-bodied, air- or water-cooled. The Leybold (German high vacuum company) representative I spoke to said that he spent a lot of time trying to convince the Dutch glass shops to get away from the mercury units, but so far only two have done it.

This is a tough battle for him: the local bias against oil diffusion pumps is quite firm ("Backstreaming and contamination; forget 'em"). The alternative then is turbomolecular, at enormous expense.

The dangers of mercury are either not known or dismissed, as evidenced also by it being used for guages, both high-vacuum and backfilling (yes, I saw a column of mercury-filled glass maybe three feet tall for this purpose). Asbestos too is in abundance, for bench covering and the like.

None of this is too surprising given that tobacco is not a carcinogen over here. At least that's the impression you get -- the stuff is everywhere, along with booze. Americans who nix them both are seen as "health fanatics."

But the mention of mercury leads to another story, that of the 30-year-old pump station I was given to start up the Neon Workshop with. The saga of getting it working, with the unrealistic expectation by the bosses that we'd be up and running within a week of my arrival, can be best summed up as "all pressure and no vacuum." Some details:

-- The system had a tiny single-stage thunka-thunka ancient forepump, Leybold brand. The device on the top of it, which I took to be a high-vacuum solenoid valve (to prevent oil from sucking into the manifold), would stick shut, and when opened up for inspection, well, we never did get it back together again.

-- That same cute little pump had a three-phase motor. The shop wiring had two separate three-phase receptacles. We connected the pump's cord and plug and tested it on with one receptacle, and then hooked it up to the manifold using the other receptacle. Since the three-phase leads were reversed in the shop wiring, the pump ran in reverse and immediately shot all of its oil into the manifold.

-- The manifold, being of one-piece pyrex construction and connected to a mercury vapor diffusion pump, was full of mercury. After spending a day with old black grease and tissue paper and acetone fumes and strangely bent pieces of heavy wire, I had the manifold cleaned and freshly greased, and then plugged in the forepump (see above). After cleaning and greasing the manifold again I found the huge, oversized stopcocks to be incredibly stiff to operate, which led ultimately to its downfall with a sudden break one day.

-- The mercury diffusion pump. Despite strong feelings to the contrary (like, "let's bury this sucker"), I tried to get it up and running, which meant obtaining not only enough mercury but a glass vial to measure it in. This was itself a trick in a country that speaks English quite well -- until you get down to itty bitty technical things.

We hooked up a water hose with a return line to the sink, and finally -- yes! -- it appeared to be doing something, but not much. At which point the heater element burned out...

The upshot was that after much wasted time we now have a teflon stopcock manifold, good gauges, a two-stage Leybold forepump and 50-liter turbo pump. Phew!

Another problem that came up was uneven gas pressure. We're using city gas (first time away from bottled propane for me) and the torches were alternately flaring and going out.

(see Setting up, page 13)

(Edward's letters, from page 9)

more even, if you desire that. I like the pinstripe and halo effect better.

Hopefully the proposal will be accepted; I'm sure the real thing will be as much fun as the model...

(Oct. 12): Hi guys -- how's tricks? Everything here in Jersey is pretty good. Two weekends ago Brian and I went up in a Pitts acrobatic bi-wing plane. What a rush! We flew upside down, did loops, wing-overs and other "wish I brought extra underwear pants" kind of stunts.

Still involved in interesting work -- more and more from NYC. I got to build a box for a magician. Within the box will be some luminous tubes and magic stuff!

(Oct. 15): ...There are pieces of glass I manipulate which are known as traps. They are eight inches long with a bubble in the center.

Watching the glass change properties is a very romantic sight. As it is held over a gentle blue sea of heat, its color changes, its rigidity is no more.

In the semi-liquid medium is tranquility. It slowly becomes pliable and with precise timing can be blown into shape: the serenity of thought in form.

As the glass takes its time to cool, I tease myself to see if I can touch it without leaving a burning scar. Sometimes there is great pain -- the glass is hostile and the gentle blue sea of heat has become an outraged and torrid fire. Sometimes the glass is easily welcomed into my hand as it is still warm with the passion and care that makes it what it is.

If for no other reason, do it for love.

(Nov. 26) ...Went to the "Sign World East" (trade show) -- not too luminous tube industry-oriented. Technolux has imported a hot turquoise, very VIBRANT. They also have trick tube supports; don't know if they are available here...

Don't know what the deal is with the pyrex manifold market -- WHAT IS THE DEAL?! HUH? YOU KNOW?

I'm not sure I agree with them. O.K., you can take them apart and clean them; you don't have to grease their stopcocks as much but you do have to put out a lot of cashola...

I remember my first manifold. It took me nineteen hours to fabricate and it was what could be compared to -- let's say hell! Shall we?

Sounds like a beginning to a love story or something...

I remember my first manifold; those were the days (tomorrows will probably be those days as well, I suppose).

Yeah, we were something special together. Sure our relationship leaked once in a while, and sure it broke into hundreds of illions of pieces once in a while, but it was always fixable. There was a strong foundation between us and the glass we brought to life (light).

It's getting to be that a manifold or part for one can be drop shipped (drop shipped ha ha!). Where is the love? Where is the desire to overcome? The respect that me and Maniflia (that was her name) shared... Oh, is it going to become a boxed and overstocked, overpriced common commodity?

Yes, the respect. I know the (sigh!) feeling of accomplishment wasn't easily accessed. Maniflia knew I was immature and didn't know how to handle her at times, but she wanted me to learn. She wanted me to carefully anneal her feelings before she cracked under the stress of stress (and stressing situations).

It wasn't easy, but love never is. It took lots of work and TLC. Actually more TLC than work, but we made it two years. We grew together, we learned together, we cried (a lot) together.

(Wow, cool, huh? Just have to splurge with the right-side brain waves once in a while.)

I think my point is this: are the new, young tubeheads coming into the market going to know that sense of accomplishment? Can it be the same feeling, fixing a manifold with TLC or replacing a replaceable part? I don't know what my point is -- I'll just keep writing.

Maybe it's just the industry changing. Maybe the suppliers of these new manifold systems and bombing stations aren't interested in just money. Maybe these manifolds ARE better.

But when these manifolds start selling, are these suppliers going to be reluctant (more than now) to help with questions and answers? Are they going to say, "What type of bombing station do you employ? Well, we recommend our mega-milliamp-pyrometer-pirani-millibar-supported bombing station. We don't have your problem with our set-up"?

Instead of hitting the market with new products and new info for these new products, why not get rid of some of the fog that exists now with current products -- shopmade or not. Why not sponsor or hold some classes?

Yeah, that's right, classes. Numerous claims are made that tubebenders don't talk the same language as the engineers and physicists who hear our questions via sales reps -- well, TEACH THE LANGUAGE OR LEARN OURS. Most tubebenders are persistent and willing to learn. It's what makes us tubebenders...

AGH! Sorry guys -- getting out of line again...

Luminously yours,

-- Edward

(Bull, from page 16)

complaining, paranoid drunks? (Just kidding.) Or will someone volunteer their phone or fax for a last-minute announcement of a congenial bar and time to meet? We'd do it, but international phone rates are a bit steep. You should get another NN issue before then, so we can help publicize such an event...

From John Hulse, of Bend OR, comes this desperate plea:

"Help. Help. Tell me how to get around a code (410-80) -- for some reason the state of Oregon will not let me save some electric, they say I cannot put white neon in homes. I know it's being done in other parts of the country but Oregon is a few steps behind. Any help you can give me will make my life better."

<Well, who would have thought that things would take a wrong turn in Bend, of all places! We can only depress and confound you further with the news that interior neon is technically illegal all over America, according to NEC rules (which, I believe, are in the process of changing).

Maybe try Audie's suggestion (NN#6): tell them it's not neon, just "long, skinny light bulbs."

Seriously, we're interested in others' stories and suggestions about this. (On a related note, one installer/ repairman promised to write about "UL inspectors I have known," so stay tuned...)>

C. Michael Barsotti of Lawrence KS sent a copy of an EGL electrode ad showing a tiny ball of mercury, and this note: "All through my work as a tubebender that is approximately the amount I'll use. But I've never found anyone to agree with me; they'll use up to ten or fifteen times this amount. What does anyone think about using this amount of mercury in an argon unit?"

From Jim Piver: "A good slide ratchet bar (NN#7) is a car bumper jack post, with the thumb latch you have shown: ready made (lazy me)." Just after the last Neon News went to press he moved; for those interested in contacting him about his torch system the new address is: 26608 188th Ave. SE, Kent WA 98042.

Gentle touch extends backfill gauge life

Before coming to Amsterdam I talked to one American tubebender about different dial-type backfill gauges and he said he'd bought a Leybold Diavac gauge for backfilling tubes and didn't like how slow it was: "When there's 13 mm of gas in the tube, the gauge only reads 3 or 4."

The Amsterdam system came with one of these gauges, and on the back centering-ring connection it has a sintered-metal filter which causes this delay.

I asked the Netherlands Leybold rep whether or not we'd ruin the gauge by removing it, and he said no. He said that it is there to protect the gauge diaphragm in the event of a "catastrophic" inrush of air ("Oops, I just smashed my manifold").

So I took the sintered metal disc and drilled a tiny hole in the middle of it. This way the gauge responds quickly and still has some degree of protection.

Which gets into a discussion about metal backfill gauges (as opposed to your standard fluid-filled manometer). I bought one for Volcano Neon a couple years ago, a "CVS" brand, and it worked fine for a while.

But then either it or its mounting stem developed a tiny leak, and upon sending it back for testing I was informed, after they had gone ahead and repaired the thing, that it was no longer accurate and required a new capsule, so please send $250.

Ouch. So I said, how can I keep this from happening again? Does sudden venting to atmosphere screw it up?

I received this answer from Michael Hall at Masonlite:

"We have been using capsule dial gauges for many years in our bombarding and pumping units, and when treated with care they are reasonably reliable. However, the following points are worth noting.

"1) The capsule dial gauges that we use are calibrated at 6 mbar or 6 torr, they are therefore correct at this pressure and deviate very slightly from a true reading at all other pressures. The error is acceptably small.

"2) They are capable of being let 'down' at atmospheric pressure, but this should only be carried out gently. A rapid rise in which the needle 'slams' into the end stop will distort the mechanics of the gauge and lead to erroneous readings.

"3) A point recently raised by Henry Brown of Transco is that capsule dial gauges suffer from a phenomenon known as hysterisis. This means that if you fill to pressure "X" the reading will be reasonably accurate. If you overfill and evacuate back down to pressure "X", the reading will be more inaccurate. This inaccuracy varies from manufacturer to manufacturer and also depends on the pressure "X".

"4) Often capsule dial gauges will not actually read zero unless tapped on the front face. This is related to the above hysterisis where the mechanics are lagging behind the real situation."

There are precious few manufacturers of these, and prices vary widely, from about $345 for an Edwards gauge (calibrated in the torr range (0-40), with an NW16 KF fitting) to $1,200 for Wallace & Tiernan's model #61C-1D-0020, series 300 (P.O. Box 178, Newark NJ 07101. Tel: (201) 759-8000). Other sources that come to mind are Leybold and Transco; if you know of others, send them along.

(Setting up, from page 11)

Being an avid reader of the Neon News, I remembered an article in #3 about what to do in this situation (besides get mad at the torch). I requested a booster pump, and the response was that "they're not allowed here." I was stymied for a while, but kept pushing the point, and have this to share:

A pressure gauge for gas is quite simple to make yourself. When the plumber showed me his pro model, I said, hey, I can do that.

With just a single U-bend in a four-foot stick of clear 10mm glass, connected via rubber hose to the gas line, I have myself a gauge. A piece of paper tacked on behind it shows the scale. To increase visibility I replaced the water inside with coffee, and at any time now I can glance over at the "coffee gauge" to see what's up.

Of course the specific gravity of coffee isn't the same as water or anything else official, but it's the overall movement (or lack of it) that's significant in this case.

The city gas company said that the gas coming into our line should be within a few centimeters at the low and high points. The gauge showed a general 8 centimeter variation, with steady bursts going even higher.

A booster pump is for when the pressure is not enough (such as a large apartment building); it won't help uneven incoming pressure. Scratch the booster pump idea in this case.

There are two types of regulators available here (and presumably elsewhere). The first, about $100, is of a simple design, and while it completely leveled the coffee gauge of all fluctuation and bumps, it left one problem: it doesn't compensate for a change in use. When a second torch is turned on, the pressure drops, changing the flame setting on the first.

Thus the fancy regulators with a feedback circuit: they compensate for changes in quantity used, and maintain an even pressure. Local cost is about $350. Can't wait to get ours.

On the hard days, remember this: at least you aren't hauling your neon to installation sites via bicycle. We met a gentleman in the sauna who said that was the norm for decades here, until everyone started getting cars in the sixties... He said protecting neon from cavorting kids on long-distance deliveries via trains and trams was a trick as well, unless they used closed transport cases which tied the glass onto hammock-like ropes...

Songs to bend by

Jim Piver sends his list of neon songs:

"On Broadway" -- the Drifters
"My Woman From Tokyo" -- Deep Purple
"Caught in the Crossfire" -- Stevie Ray Vaughn
"Up Around the Bend" -- Creedence
"In the City" -- Eagles
"Sounds of Silence" -- Simon & Garfunkel
"Down on the Boulevard" -- Jackson Browne
"Gene Genie" -- David Bowie

"I'm sure there are many more; which ones by Tom Waits?"

<Ted adds Dylan's "Tangled Up In Blue" and the Dead's "Truckin'" and "Feel Like a Stranger"... and notes that in one song Tom Waits not only mentions the neon but says it's buzzing too...

So how about more songs sent in, including the relevant lyrics too?

Sweetheart suppliers and surprising finds

Passed our way by Mark Miller of Tempe, AZ:
Duniway Stockroom Corp.
1600 N. Shoreline Blvd.
Mountain View, CA 94043
800-446-8811; 415-969-8811; Fax: 415-965-0764

Duniway specializes in low prices on name-brand high-vacuum equipment, much of it used or rebuilt. They also offer generic equivalents. Some interesting selections from the 1990-1991 catalogue (presumably the one-of-a-kind used items are long gone, but perhaps there's a new bunch now):

-- Rebuilt Welch 1402 pumps complete with motor, base and belt guard, $750.

-- "Epoxy Patch -- chemically similar to Varian 'Torr Seal'" -- $17

-- Thermocouple gauge, generic with Hastings gauge tube, $185 complete (now there's no more excuse not to have one). Replacement gauge tubes $36.

I purchased one of these for the new workshop I'm setting up, and tested it on my home system. It read exactly the same as my HPS pirani gauge, difference being that a pirani starts at atmosphere and this one starts at 1000 micros. At the lo end (1 to 200 micros) the scale takes up a larger space than the pirani, making it easier to read.

-- Many brands of surplus pumps, such as Leybold, Edwards, Welch, etc.

-- Surplus metal diffusion pumps $190 & up (typically $300).

-- Turbomolecular pumps and other big-buck items for the sci-fi set.

-- Stainless KF flanges and fittings at decent prices.

(Note: These prices are a little outdated & somewhat higher now).

One regular source suggests checking out a technical journal called **Fusion**, which has sections on new products, literature, references and abstracts that are relevant to glasswork.

Another magazine, **Glass Line**, has been around for five years, but he (and we) just learned of it.

Any suggestions on finding copies of these? Somebody send us addresses, please, or an issue to peruse (we'll extend your sub an issue in gratitude), since it's hard to chase down such things from here.

Tom Tokarski of Parco Neon in Livingston MT endorsed **Gerber's single-line Helvetica font** as helpful in pattern-making. He sent along an article from the Gerber newsletter that explains how to make flashy designs to show customers, with the pattern-making capability relegated to the end of the article: "You can, of course, use the same technique to create neon patterns for the neon man (sic), who can pencil in the cutoffs and line extensions himself."

Candice King suggests **Houde Glass** at (800) 526-1275: "They carry all kinds of strange glass. I buy a lot of colored cane glass (glass rods) from them.

And she adds: "I've used **Carlisle** fires for 15 years and like them very much. I had them custom make a set of 8-point crossfires for me to use on 25mm tubing. They don't seem very friendly on the phone but I like the burners.

"Always order the ball type instead of the plain (cheaper) hex head for your crossfires or you'll never get the damn things put together without bending your tips."

From Bob Lind at Tri-State Signs in Windham NH: "M. Weber asks about illuminating one-electrode tubes. **Information Unlimited** has some great power sources and we've successfully processed many 26-inch-by-9mm argon and neon tubes fully illuminated by their device; 5mm of gas pressure seems to work O.K. Bob Lanninni is the contact man." **(Information Unlimited, Box 719, Amherst NH 03031)**

Charles Steele (213-933-5464) sent a photo and some info on a weird-looking new tube support. It uses a standard Voltarc metal base but has an upper section of spiraling nylon, available in black or white, for $1 each. Nylon ratcheting ties (used nowadays in automotive and electrical work) secure the glass to the support; they're 25 cents each. He points out that it can be shortened or lengthened, and never splits, falls out or breaks (like its glass counterparts). This, he says, "adds the flexibility needed by today's less precise neon field." Well!

For that total sign restoration job: Call **Dupont** (800-555-1212 to get their 800 number) and get info about their two-part epoxy paints and a dealer near you. Ted used their T-10 rusty-metal primer for the Palace Theatre sign restoration, and although it went on with the ease of old, snotty glue it seems like it'll fight off rust far better than your average paint. The cover coats of "**Imron**" are reputed to hold up extraordinarily well also (they're used on airplanes). It's expensive, but consider that it might save you (or someone else) another miserable trip up where you apply it, some years down the line...

Answering Tom Kramer's plea for a source for one-piece chrome handtorches: it turns out that **Montroy Supply Co.** (in California and other western states; check the suppliers list in Signs of the Times) has these.

(Workshop, from page 7)

the length of a given ribbon bend), or making certain bends exactly right (instead of the usual "pretty close") because you just did three and you're doing 12 more. But I assure you that the fun wore off after, oh, the first 25 I made.

Hopefully the situation will change, with the models for similar large point-of-sale orders done here and the multiples made abroad. And eventually a wet-powder system will be set up to handle repairs and special projects, and those who come here to crank out lead glass can learn the soda techniques, and those who crank out soda glass can learn lead glass techniques.

But in the meantime (yawn)...

The Universal Law of Greener Grass says that whatever is distant is exotic, and it applies here to neon as well.

What is the most obnoxious, pervasive form of neon in America? Beer signs. What is the most exotic, glamorous kind of neon you can get here? American beer signs.

To a European, all those stiff, sharp corners are commonplace; but a good, small, flowing line is hard to find. One nickname for the American glass is "spaghetti neon," due to the bent-noodles appearance.

And with a wholesale cost of around 60 guilders per meter ($10 per foot), be it for straight tubes, channel letters, block letters or script -- it's no wonder that a lot of benders here don't like small script!

Good, bad and ugly neon, part III: Customer post-mortems

By Audie Foote

This is it, folks: the climax of the NEON TRILOGY. In previous issues, I covered the bidding process and dealing with customers; the recent rash of attacks by automatic-weapon-armed crazies convinced me that my articles were indeed being read.

And while I agree that the pen is mightier than the sword, I sometimes wonder how it compares with an AK-47 assault rifle. So if I offend anyone out there, I want you to know that the name "Audie Foote" is a pseudonym (you didn't think that was a real name, did you?), and you should address all written or physical complaints to: Sythe Whetmueller, R.R.#1, Barrow, Alaska. Thank you.

Having said that, I feel much better about revealing the conclusion of the NEON TRILOGY. Since most jobs go well and most checks we receive sail into our accounts without an annoying "stop payment" order, I'm going to go right to The Verdict: How does the client like the sign? (And where's the check?)

So I've gone through my extensive files and found two classic examples of verdicts we did not expect, and how I shrewdly dealt with them.

See if you can top this: I got a frantic message on my phone machine one morning from a storeowner who screamed something about "Buzzing! It's buzzing!"

Naturally, I thought she was talking about the brand-new 12,000-volt transformer installed in her sign, but I decided to check it out myself, rather than send someone, since she was so upset.

When I got there everything appeared to be normal; there wasn't even the slightest hum from the transformer, and I quickly told her so.

The elderly lady (who bears a striking resemblance to Danny DeVito's mother in "Throw Momma From The Train") snarled at me, "I didn't say it was the sign buzzing, you moron, I said the sign is making my HEARING AID buzz!"

Apparently if she got within three feet of the sign, which was located right behind the sales counter, she felt like a hive of angry bees were flying around her head. She also told me that she often picks up police radio frequencies.

So I asked her to turn off her hearing aid and then asked her, "Is the buzzing gone now?" She yelled, "WHAT??" ...Another problem solved. (Actually, she went for a newer hearing aid and the buzzing went away.)

This was not unusual enough for you? How about the call I got from a customer who said, "The sign you installed last week is flickering and IT SMELLS BAD TOO!!"

Strange, there's no mention of that symptom in my Neon Troubleshooter's Guide. SMELLS BAD?

(I could be really mean and tell you the answer in the next issue, but what the hell.)

Well, it seems the electrician who wired the transformer in the ceiling forgot to put the lid back on the metal box and a big, ugly rat who thought he'd found a new condo apartment got the shock of his life, 15,000 volts worth, and became the cause of both the flickering and the smell.

Can you picture me standing on top of a ten-foot stepladder with my head in the ceiling while I gagged and retched uncontrollably? To make matters worse, the rat was looking right at me, as if saying "Look what you did to me!"

Frankly, I'm sorry I even brought this up. Suffice it to say that the solution had something to do with a screwdriver and a flick of the wrist toward another part of the ceiling.

When I came down off the ladder, the flickering was gone, and I informed the guy that he had a rat in the ceiling. He didn't like hearing this because the place was a restaurant, so he said, "There is no rat in my ceiling," and I said, "Well, technically speaking you could be right because he's dead," and then I went and dry-heaved into the bushes in the parking lot.

Now that I've made all of us sick, I want to say that this kind of true story is commonplace in the neon business. Not a day goes by without something neon-related happening that makes me stop and say "What was that?" If you have stories like this, I'd like to compile them into a collection called "Neon Mysteries," or maybe, "Audie's Believe It Or Else."

And if anybody who claims to be in the neon business says these kinds of things don't happen to him or her, remember my famous reply:

"I SMELL A RAT!"

A view from the other end of the tube...

<Tom Fling at Eurocom sent this good argument for shorter tubes:>

...[P]umping procedure determines many things related to the function of the finished discharge tube. ...VOLUME of gases evacuated from the tube or tubes at one time is a strong factor determining quality of tubes. It is as critical as the configuration of the pumping system and electrodes utilized.

Our demonstrations during seminars and installations of pumping systems 'show and tell' the extreme differences between the vacuum achieved at the manifold and at the far end of the tube:

A 12-foot-long 15mm tube is assembled with a tubulated electrode at one end and a flange tube at the other. The electrode is welded to the manifold and a second Pirani vacuum gauge is connected to the flange tube at the other end of the tube.

We proceed to evacuate the tube for 30 to 45 minutes to pump out a large degree of condensation created by the welding procedure. We then fill the tube with air and open the main stopcock to begin evacuation of the tube.

After three minutes (the average time allotted for evacuation while the tube is still hot and the impurities have not recombined) the Pirani instrumentation on the manifold indicates we have reached the area of vacuum below 5 millitorr (microns).

The Pirani at the other end of the tube, however, indicates pressure there as somewhere between 60-100 millitorr or even higher depending on the pumping system.

This simple test clearly demonstrates that tubes exceeding 7-8 feet should be avoided. Processing two tubes of this length (equivalent to 14-16 feet) at one time should be avoided at all costs.

We execute this demonstration with a large turbomolecular pump in the system with the same results. The end vacuum, of course, reads far better than with a rotary vane pump alone, however, the drastic difference measured at both ends remains practically the same.

The shorter the tube, the higher the quality discharge tube produced.

BULLETIN BOARD

Rob Jacklyn of Mill Valley CA (Urban Clutter Neon Co., a favorite name) scrawled: "Dear folks -- Appreciated the pre-sealed return envelope. *<You're welcome; it's damn damp in Volcano.>* Nice marketing touch... Found the article on discoloration really interesting. This really needs to be followed up. My work done in 1982-86 or so, when I had a $100 beater pump and glass stopcocks, is still clear as a bell. Much of my new work (done on metal manifold, diffusion pump, full instrumentation, state of the art etc.) discolors and some must be redone. I've tried everything I can think of. If it's simply the glass we should pursue this." *<Anyone have any more hard facts on this that won't pull us into libel court?>*

Daniel Dezort of the Neon Store in Sacramento CA sent a photo of his truck with a neon "neon" in the rear window, and this note: "The sign is still illegal, as confirmed by a CHP officer the other night. I must keep it unplugged now or suffer a $100 fine."

Speaking of which: Jeremy Storm of Volcano HI took his 8mm neon guitar out of the rear window of his car, complaining of too many tailgaters. He replaced it with a small red "WHOA" and connected it to the brake light switch -- with an additional "off" toggle switch, for when the car behind has lights of another kind.

Charlie Malorana sent us a videotape of the group neon art show held recently in the Washington DC area; copies are available for $25 from Craig Kraft Studio, 3829 Plyers Mill Rd., Kensington MD 20895. *<It's interesting, in part because the tape raised some questions in our minds about filming neon. It struck us as static; the camera never moves or uses its three-dimensional possibilities to give a "gallery view" of the art -- when you're there you walk around each piece to look from different distances and angles, right? ...Anyone want to write about ways to photograph and videotape neon?>*

Margie Newman of Cicena ("the world's leading manufacturer and marketer of neon-accent and retro-inspired electronics") in New York sent literature worth quoting:

"Our aim is to provide our customers with an encyclopedia of visually exciting products supporting various segments of the consumer's lifestyle... Neon is poised to charge into the lifestyle market in the 1990s -- everyone can enjoy the sheer brilliance of neon in their own homes."

<We'd quibble with the less than sheer brilliance of the product names: the speakers, phones, clocks, etc., have women's names like Roxanne, Marilyn, Dixie, Jennifer, Cleo, Billie Jean, Jackie, Rhonda, etc. (The exception is a "classic automotive shape" with an appropriately testosterone-soaked tag: the Cruiser.)

<Maybe the Neon News can help by suggesting a parallel group of product names that suggest... well, something similar: Rock, Dickie, Joe-Bob, Monte, Nick, and Brutus?>

Seen in a sleazy corner of Honolulu: Genuine E-Z-change neon. Someone took a tube that spelled "BAR" in 8-inch capitals and changed it to spell "CAR" by putting black tape over half of the "B". Kind of square on the "C" curve, but what the hell...

Electro-whiz John Nelson of State College PA writes: "Ever since I was zorched by the great Neon God a couple of months ago, I've been sucking up every bit of information I can find about tubebending. I feel sort of like those little Pac-Man things from the TUMS commercial that eat fifty times their weight in stomach acid. It's been tough, as a novice, finding any kind of comprehensive source other than the mid-jurassic 'Neon Techniques and Handling,' and the back issues of Signs of the Times... Now all I have to do is learn how to bend glass..." *<Don't sweat the small stuff, huh?>*

An offer we could refuse: Recently got a pompously-worded prospectus for a report on "The U.S. Market for Electric Signs." For only $265 you could purchase such dubious insights as "Imports pose no threat to electric sign producers" and "To maintain your position in this market ... you should grow at about 14 percent per year from now through 1992." Bean-counter logic is clear in the assertion that "Payroll costs are quite high and must be seriously controlled by producers of electric signs." In other words, tube benders ought to make minimum wage? Maybe the $55 made-in-China neon clock we saw here is the coming thing.

It's a good time to set up something unofficial for benders at NESA again. Someone in the area want to play host to a bunch of

(see Bull, page 12)

ADS

Neon sign color postcards: Pontiac Indian, Buster Brown, Mobilgas flying horse, Simple Simon, etc. 50 cards $13.50. Davidson, 860 N. 26th St., Philadelphia PA 19130; (215) 232-0478.

Neon tube bending plant. Complete DACO set-up ready to go (you provide space, etc.). Many extras included. $3500. Call Ray: (510) 848-3163 (SF Bay area).

Neon Dynamics 3700 series power supply. All models, largest distributor, best pricing. Max Marketing-Neon. 19807 Sussex Dr., St. Clair Shores MI 48081. Call 24 hours: (313) 773-5000; fax (313) 772-6224.

THE NEON NEWS

THE NEON NEWS, P.O. BOX 668
VOLCANO, HAWAII, 96785
(808) 967-7648